

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1. (Previously Presented) An immunogenic composition comprising an IL-13 element that drives an immune response that recognizes human IL-13 and at least one foreign T-cell epitope.

2. (Previously Presented) An immunogenic composition as claimed in claim 1, wherein the T-cell epitope is foreign with respect to human self-proteins and IL-13 sequence from other species.

3. (Previously Presented) An immunogenic composition as claimed in claim 1, wherein the T-cell epitope is a short peptide sequence added to the IL-13 sequence.

4. (Previously Presented) An immunogenic composition as claimed in claim 3 wherein the carrier protein is selected from the group of: *Haemophilus influenzae* Protein D and CPC (clyta-P2-clyta).

5. (Cancelled)

6. (Previously Presented) An immunogenic composition as claimed in claim 3, wherein at least one short T-cell epitope is added to the IL-13 sequence by an event selected from the group of: an addition and a substitution.

7. (Original) An immunogenic composition as claimed in claim 6 wherein the short T-cell epitope is a promiscuous epitope.

8. (Previously Presented) An immunogenic composition as claimed in claim 7 wherein the promiscuous epitope is selected from the group of: P2 and P30 from tetanus toxoid.

9. (Previously Presented) An immunogenic composition as claimed in claim 1, wherein the IL-13 element comprises the entire human IL-13 sequence.

10. (Original) An immunogenic composition as claimed in claim 9 wherein the IL-13 element is in mutated form.

11. (Original) An immunogenic composition as claimed in claim 10, wherein the mutated IL-13 is in the form of a chimaeric IL-13 formed by substituting amino acids with amino acids that are found in equivalent positions within an IL-13 sequence from another mammalian species.

12. (Original) An immunogenic composition as claimed in claim 11, wherein the substitutions occur in areas that are associated with alpha helical regions.

13. (Previously Presented) An immunogenic composition as claimed in claim 11 wherein the substitutions involve amino acids taken from more than one different non-human mammalian species.

14. (Previously Presented) An immunogenic composition as claimed in claim 1 wherein the IL-13 element is human chimaeric IL-13 sequence having a similar conformational shape to native human IL-13 and sufficient amino acid sequence diversity to enhance its immunogenicity when administered to a human, wherein the human chimaeric IL-13 sequence has the sequence of human IL-13 comprising:

(a) substitution mutations in at least two of the following alpha helical regions selected from the group of: PSTALRELIEELVNIT, MYCAALES LI, KTQRMLSGF and AQFVKDLLLHLKKLFRE;

(b) comprises in unmutated form at least six regions of high inter-species conservation selected from the group of: 3PVP, 12ELIEEL, 19NITQ, 28LCN, 32SMVWS, 50SL, 60AI, 64TQ, 87DTKIEVA, 99LL, and 106LF; and

(c) optionally comprises a mutation in any of the remaining amino acids, wherein any substitution performed in steps a, b or c is a structurally conservative substitution.

15. (Original) An immunogenic composition as claimed in claim 14, wherein greater than 50% of these substitutions or mutations comprise amino acids taken from equivalent positions within the IL-13 sequence of a non human.

16. (Previously Presented) An immunogenic composition as claimed in claim 14, wherein greater than 50% of these substitutions or mutations occur in regions of human IL-13 which are predicted to be alpha helical in configuration.

17. (Previously Presented) An immunogenic composition as claimed in claim 14, wherein the human chimaeric IL-13 sequence has the sequence of human IL-13 comprising between 2 and 20 substitutions.

18. (Previously Presented) An immunogenic composition as claimed in claim 1 wherein the IL-13 element is based on a non-human IL-13 sequence wherein the non-human surface exposed regions are substituted for the equivalent human sequences.

19. (Previously Presented) An immunogenic composition as claimed in claim 14, wherein the amino acid sequence of human IL-13 comprises conservative substitutions in at least six of the following positions selected from the group of: 8T, 11R, 18V, 49E, 62K, 66M, 69G, 84H, 97K, 101L, 105K, 109E, and 111R.

20. (Previously Presented) An immunogenic composition as claimed in claim 19 comprising at least six of the following substitutions selected from the group of: 8T to S, 11R to K, 18V to A, 49E to D, 62K to R, 66M to I, 69G to A, 84H to R, 97K to T, 101L to V, 105K to R, 109E to Q, and 111R to T.

21. (Previously Presented) An immunogenic composition as claimed in claim 1, wherein the IL-13 element is selected from the ~~following~~ group of: Immunogen 1, Immunogen 11, Immunogen 12 and Immunogen 13.

22. (Cancelled)

23. (Cancelled)

24. (Previously Presented) A method of designing an immunogenic composition as claimed in claim 1 comprising:

(a) identifying regions in human IL-13 (SEQ ID NO. 1) that are predicted to form an alpha helical structure;

(b) mutating the sequence of human IL-13 within these alpha helical regions to substitute amino acids from the human sequence with amino acids that are either a conservative substitution or are found in equivalent positions within the IL-13 sequence of a different species; and

(c) attaching or inserting a source of T-cell epitopes that are foreign with respect to any human self epitope and also foreign with respect to any mammalian IL-13 sequence.

25. (Previously Presented) A method for the manufacture of a human chimaeric IL-13 immunogen which has a similar conformational shape to native human IL-13 and sufficient amino acid sequence diversity to enhance its immunogenicity when administered to a human comprising the following steps:

(a) performing at least one substitution mutation in human IL-13 (SEQ ID NO. 1) in at least two of the following alpha helical regions selected from the group of:

PSTALRELIEELVNIT, MYCAALES LI, KTQRMLSGF and AQFVKDLLLHLKKLRFRE];

(b) preserving at least six regions of high inter-species conservation selected from the group of: 3PVP, 12ELIEEL, 19NITQ, 28LCN, 32SMVWS, 50SL, 60AI, 64TQ, 87DTKIEVA, 99LL, and 106LF;

(c) optionally mutating any of the remaining amino acids; and

(d) attaching a source of T-cell epitopes that are foreign with respect to any human self epitope and also foreign with respect to any mammalian IL-13 sequence, -wherein any substitution performed in steps a, b or c is a structurally conservative substitution.

26. (Original) A method for the manufacture of a human chimaeric IL-13 immunogen as claimed in claim 25, wherein all four alpha helical regions comprise at least one substitution mutation.

27. (Previously Presented) A method for the manufacture of a human chimaeric IL-13 immunogen as claimed in claim 25, wherein there are no mutations at any region of high inter-species conservation.

28. (Previously Presented) A method for the manufacture of a human chimaeric IL-13 immunogen which has a similar conformational shape to native human IL-13 and sufficient amino acid sequence diversity to enhance its immunogenicity when administered to a human, the method comprising the following steps:

(a) aligning IL-13 amino acid sequences from different species;

- (b) identifying regions of high variability and high conservation;
- (c) mutating human IL-13 (SEQ ID NO. 1) in the areas of high variability to substitute amino acids from the human sequence with amino acids that are either a conservative substitution or are found in equivalent positions within the IL-13 sequence of a different species; and
- (d) attaching a source of T-cell epitopes that are foreign with respect to any human self epitope and also foreign with respect to any mammalian IL-13 sequence.

29. (Previously Presented) A method for the manufacture of a human chimaeric IL-13 immunogen as claimed in claim 24, wherein all greater than 50% of these substitutions or mutations comprise amino acids taken from equivalent positions within the IL-13 sequence of a non-human species.

30. (Previously Presented) A method for the manufacture of a human chimaeric IL-13 immunogen as claimed in claim 24, wherein greater than 50% of these substitutions or mutations occur in regions of human IL-13 which are predicted to be alpha helical in configuration.

31. (Previously Presented) A method for the manufacture of a human chimaeric IL-13 immunogen as claimed in claim 24, wherein substitutions or mutations comprise amino acids taken from equivalent positions within at least two non-human IL-13 sequences.

32. (Previously Presented) A method for the manufacture of a human chimaeric IL-13 immunogen as claimed in claim 24, wherein the immunogen comprises between 6 and 20 substitutions, and most preferably between 6 and 10 substitutions.

33. (Cancelled)

34.(Cancelled)

35. (Previously Presented) A polynucleotide vaccine comprising a polynucleotide that encodes a IL13 element as claimed in claim 1.

36. (Previously Presented) A method of treating an individual suffering from or being susceptible to CPD, asthma or atopic dermatitis, comprising administering to said individual a vaccine as claimed in claim 34, and thereby raising in that individual a serum

neutralizing anti-IL-13 immune response and thereby ameliorating or abrogating the symptoms of COPD, asthma or atopic dermatitis.

Claims 37-38 (Cancelled)

39. (Previously Presented) An immunogenic composition as claimed in claim 1, wherein the T-cell epitope comprises a carrier protein.

40. (Previously Presented) An immunogenic composition as claimed in claim 39, wherein the carrier protein and IL-13 element form a fusion protein.

41. (Previously Presented) An immunogenic composition as claimed in claim 3, wherein at least one short T-cell epitope is added to the IL-13 sequence at a terminal end of the IL-13 sequence by means selected from the group of: synthetic, recombinant and molecular biology.

42. (Previously Presented) An immunogenic composition as claimed in claim 1, wherein the IL-13 element comprises functional equivalent fragments of the human IL-13 sequence.